China: Radio Frequency Identification (RFID) Industry

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Summary

In China, the world's third largest economy, Radio Frequency Identification (RFID) has been developing rapidly with substantial support from the Chinese government. RFID is a system which can be used to track any good that includes an imbedded computer chip; such goods can be tracked when they pass close to another electronic device known as a "reader". Gartner Inc., a well known information technology and advisory firm, estimates that the global RFID industry will enjoy a compound annual grow rate of almost 15 percent from 2008 through 2013, increasing in size from just over USD 5 billion in 2008 to USD 9.8 billion in 2013. China's RFID market totaled approximately USD 735 million in 2008, or approximately 15 percent of the world's total. However, China's RFID market is forecast to grow even more rapidly than the rest of the world at an annual rate of 21 percent reaching USD 1.3 billion in 2011. Guangdong province, the province with the largest economy of China's 31 provinces and provincial-level cities, has taken the lead in China's RFID technological development and application.

Market Demand

If China is the factory of the world, then South China's Pearl River Delta in Guangdong Province is the factory of China. Guangdong province roughly accounts for one third of China's total exports. Many of the goods with the label "Made in China" come from Guangdong, especially the cities of Shenzhen and Dongguan. The large scale of production in the region combined with its high population density has contributed to increasing infrastructure problems for the movement of goods and people. This combined with the fact that various pallets of goods produced in the region are scheduled to be shipped to locations all over the world creates an excellent atmosphere for the implementation of RFID.

RFID is a technology in which tags are used to indentify and keep track of things using radio waves. The use of RFID is beginning to become popular in supply chain management in order to monitor product movement and inventory levels more efficiently. RFID technology was initially heralded for its potential use in logistics management for supermarkets, however it is currently also enjoying implementation in manufacturing facilities, medical management, tickets, transportation, food sourcing, and library management.

The demand for RFID in China has yet to reach its peak, mainly because the cost is too high for some industries, compared with China's relatively low cost of labor. According to one source, the cost of a typical RFID label is around RMB 1.37 (USD 0.20). This additional cost is acceptable for higher priced products like cars and

home appliances but for cheaper goods like pens, food, shampoo, and toothpaste, the additional cost of installing an RFID chip is significant. However, RFID technology is still relatively young. It is expected that the cost of RFID chips, like computer memory chips, will tend to decrease over time. As RFID technology continues to develop and companies compete to create improved RFID products, prices will inevitably drop. As the Chinese economy continues to expand and incomes continue to rise, labor will become more expensive and China will likely turn to RFID more and more. Additionally, China's logistics infrastructure is in desperate need of advancement. The roads and railway systems are transporting more goods than they were designed to accommodate. RFID technology can help Chinese companies address these problems of inefficient supply chains and rising labor costs.

Despite the cost, many commercial enterprises and government agencies in China have already started using RFID technology in large part due to government encouragement. In 2006, Guangdong's local government created the Guangdong Provincial RFID Public Technology Support Center (GDRC) in order to help promote the RFID industry in the province. GDRC conducts RFID research, provides localized technical support on shared RFID infrastructure, tests new RFID technology, organizes international conferences and forums, and develops new RFID applications. GDRC's departments consist of the Comprehensive Planning Department, Software Testing Department, Hardware Testing Department, Middleware Development Department, and Application Development Department. Twenty-four companies and research institutions, including Intel, Microsoft, and the Hong Kong Polytechnic University, have agreed to provide various kinds of support to the center.

Market Data

China has become one of the largest markets in the world for RFID technology. The Chinese government is in the process of issuing new national RFID equipped ID cards to all 1.3 billion citizens. Guangdong province has taken the lead, having already issued new ID cards to all inhabitants.

China RFID Industry Top 8 Applications of the Year, 2008

1. Asino, a Chinese company, used RFID technology to successfully ensure food security during the Beijing Olympic Games. Food delivered to the athletes and competition venues in Beijing was closely monitored using an RFID system. The system tracks the entire process of production, processing, and transport. Apart from the location of the food, the RFID technology also helped keep track of expiration dates and manufacturing information to ensure spoiled food was not served.
2. China introduced the first 24 hour RFID library in Shenzhen in April 2008. Using their RFID-enabled library cards, people are able to borrow and return books and other media entirely on their own. Anti-theft security gates ensure that people don't walk out of the library without checking out. Over 2 million RFID

tags are employed now but that number will grow to 4 million as the library collects more books and other media. Librarians are still needed to tag books, place books on shelves, and assist with other issues.

3. ESeal/eLock applications were introduced in container transportation from Shanghai to American ports. RFID technology is used to track shipment containers and as an alarm system in case the containers are tampered with.
4. RFID was first used to monitor medical waste. The system is being used in Shenzhen to monitor medical waste collected from over 1000 hospitals and clinics, tracking it until it is destroyed.
5. Guangdong Heshan Astro Printing http://www.leojob.com/index.asp has implemented RFID systems in all its manufacturing facilities, becoming the largest RFID application project in terms of manufacturing facility in south China. The company has deployed RFID system in its 30+ workshops to provide real-time monitoring of the whole production process, with the goal of reducing error ratios and production costs.
6. Sichuan Province widely deployed an RFID system to monitor Compressed Natural Gas cylinders in the province. The dynamic system now monitors about 190,731 hazards in the province, tracking both their movement on trucks, and the cylinder's age and usage.
7. Beijing-based Basch Group provided RFID tickets for Beijing Olympic Games, the ticket printing used combined technology from Germany, Japan, and America. The RFID technology was used to prevent counterfeiting, provide quick check-ins for visitors at venue gates, and guard against unauthorized access to certain areas of the Olympics compound.
8. RFID applications were introduced to track pigs from "farm-to-fork" and trace food security information. The pilot application project occurred in Zhejiang province. Tags are attached to the pigs' ears.

Source: RFID World China

Best Prospects

Technology used in RFID can be divided into four parts; two of these technology segments represent excellent prospects for U.S. companies hoping to export RFID products to the Chinese market. RFID industry chains are primarily made up of chip design, tag packaging (including antenna design), identification design and development, and systems integration and software development. Chinese companies already possess mature technology in chip design and tag packaging. After 10 years development, Chinese chip developers have made remarkable progress in narrowing the technology gap between themselves and international competitors. However, Chinese industry players also acknowledged that foreign companies possess technological advantages in identification systems, and system integration and software design. Chinese companies have developed relatively mature technology on identification system readers using 13.56MHz, but are weak in identification technology using UHF frequencies, **presenting opportunities for foreign companies in UHF identification systems**. At present, **Chinese systems integrators mostly use foreign software products for systems integration design**. International companies such as Sun, SAP, Oracle, IBM, and Microsoft, recognizing China's

huge potential market, have already developed RFID related technology and database management software to suit the needs of the local market.

According to ID Tech Ex, a technology research firm, RFID for animals, food, and farming, will become the largest RFID market in the world. As the world's population continues to grow, managing the cultivation and distribution of food will become even more critical. The country with the world's largest population inevitably requires the largest amount of food to feed its citizens. The number of pigs in China's Sichuan province is more than all of the pigs in the United States and the number of chickens in China is more than the rest of the world put together. Tracking and distributing pigs, chickens, other kinds of livestock is no easy task especially when the volume is as large as it is in China. Animal tagging with RFID can facilitate this "farm-to-fork" process and help limit the spread of diseases. Foreign companies have an excellent opportunity to enter the Chinese RFID market through animal tagging.

Guangdong province started pilot RFID projects as early as 2004. Having obtained rich experience in those pilot projects in manufacturing products, food sourcing, and logistics management, Guangdong province is planning to continue utilizing RFID technology on a larger scale. For example, over 10 garment factories in the Pearl River Delta area have already been equipped with RFID management systems to monitor the whole manufacturing process and also reduce production cost. Each factory is expected to consume 160,000 tags and 4,000 readers in the next several years. Another goal is that, in the years to come all 700,000 live pigs supplied to Hong Kong every year by Guangdong province would be equipped with RFID tags for tracking purposes. Guangdong province accounts for half of the tag production in China. Key local manufacturers include Invengo, Mango, and Guangdong TECSUN (http://www.tecsuncard.com.cn/english/index.htm).

In the next five years, Guangdong Provincial government has committed to invest RMB 1 billion (USD 146.5 million) in RFID, creating potential opportunities for foreign suppliers. Adjacent to Hong Kong, Guangdong province began cooperation with Hong Kong RFID experts years ago to spur RFID development in China. Up to 2007, there were over 1300 RFID related companies in Guangdong province. Different application projects are jockeying to receive a share of these funds, examples include manufacturing firms, public service systems, transportation & logistics operators, border check between Guangdong & Hong Kong, and libraries. Such projects hope to be part of the greater goal of building Guangdong province into the first "digital province".

Key Suppliers

Major international RFID Vendors in China:

1. Texas Instruments (USA) http://www.ti.com/rfid/
2. Alien Technology (USA) http://www.alientechnology.com/
3. NXP (Netherlands) http://www.nxp.com/
4. Intermec (USA) http://www.intermec.com/
5. Omron (Japan) http://www.omronrfid.com/
6. ST (Switzerland) http://www.st.com/stonline/products/families/memories/rfid/rfid.htm
7. Impinj (USA) http://www.impinj.com/
8. Zebra (USA) http://www.zebra.com/id/zebra/na/en/index/rfid.html
9. Reva Systems (USA) http://www.revasystems.com/html/home.html
10. Psion Teklogix (Canada) http://www.psionteklogix.com/us

Source: RFID World China

Prospective Buyers

Major Chinese RFID Tag Manufacturers

1. Invengo http://www.invengo.cn/main_en.asp (based in Shenzhen, Guangdong province)
2. Aisino http://www.aisino.com/index_eng.asp (based in Shenzhen)
3. Fudan Microelectronics http://www.fmsh.com/english/index.php (based in Shanghai)
4. ASK-TongFang http://www.askthtf.com/en/index.aspx (based in Beijing)
5. Mango http://en.twh.com.cn/ (based in Zhongshan city, Guangdong province)

Major Chinese RFID Reader Manufacturers

1. Invengo http://www.invengo.cn/main_en.asp (based in Shenzhen)
2. Sense Technology http://www.sense-hk.com/En/Index.aspx (based in Shenzhen)
3. Raifu Intelligent http://www.raifu.cn/en/index.htm (based in Nanjing city, Jiangsu province)
4. Academy of Aerospace Technology http://www.chinasaat.com/ (based in Shenzhen)
5. JiuZhou http://www.jiuzhoutech.com/english/index.htm (based in Chengdu city, Sichuan province)

Source: RFID World China

Market Entry Strategies

In addition to the relatively high cost of RFID tags, the lack of understanding of RFID technology has also contributed to the slow implementation of this tracking technology. Managers in southern China companies still do not fully understand RFID technology and its benefits. These companies are hesitant to take on the costs of employing RFID technology because of very tight margins and the wide availability of hiring additional low-cost labor. In order for U.S. companies to succeed in China's potentially huge RFID market, they should develop creative marketing strategies that portray the benefit of adopting RFID technology within an organization.

Another way to enter the Chinese market is through joint ventures. International semiconductor companies like NXP (founded by Philips), EM (Switzerland), Texas Instruments, ST, Impinj, Atmel (USA), Inside (France), and Jewel (UK) have all have RFID partnerships with Chinese companies.

The Chinese government knows that China's infrastructure system is in desperate need of improvement. As previously stated, the systems in place for transporting both goods and people have met and exceeded their limits. RFID technology could potentially allow for better management of these systems and improve the speed at which people and products are transported. If RFID is to succeed in China, it will probably be in large part due to the government support. That being said, the Chinese government is not haphazardly promoting RFID; it appears that they are proceeding cautiously by observing how the technology is fairing in other countries and other markets. U.S. companies should establish a presence in their home and several overseas markets to show the Chinese government that their companies are reliable and that RFID in targeted sectors is a worthwhile investment.

Market Access Issues & Obstacles

Major international RFID standards are ISO/IEC8000 (international), EPC Global (USA), and Ubiquitous IC (Japan). Although research has been initiated to develop a Chinese standard, China has not yet established its own or adopted one of the international unified RFID standards, nor has it established application specifications or air interface specifications. While a lack of standards has slowed overall development of RFID in China, the implementation of "homegrown" Chinese industry standards have not inhibited access of foreign firms. However, China has recently issued some experimental regulations in the industry, under this pilot program, frequencies for the range 800/900 MHz were set at 840-845 MHz and 920-925 MHz with a transmitting power of 2W. Research in China has focused on the development of standards for the transportation and food safety industries.

Trade Events

RFID Guangzhou
Date: June 2010
China Import and Export Fair Pazhou Complex
http://www.eventseye.com/fairs/f-rfid-guangzhou-9116-1.html
http://www.scan-china.com/

China International Smart Card and RFID Exhibition and Conference 2010
Beijing Exhibition Center, Beijing, China
Dates: June 7-9, 2010
www.scsl-china.com/enindex.asp

References & Key Contacts

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For More Information

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